

## ABSTRACT

## TUNABLE EXTERNAL CAVITY LASER

**[00118]** Apparatus and methods that utilize dual, tunable elements to provide for selective wavelength tuning of a light beam. The apparatus comprises a first tunable wavelength selection element positioned in a light beam and having a first adjustable free spectral range, a second tunable wavelength selection element positioned in the light beam and having a second adjustable free spectral range, with the first and second tunable wavelength selection elements configured to define a joint transmission peak that is adjustable in phase according to tuning of the first and second tunable wavelength selection elements. The first tunable wavelength selection element defines a first plurality of transmission peaks within a selected wavelength range and the second tunable wavelength selection element defines a second plurality of transmission peaks within the selected wavelength range, with the first and second pluralities of transmission peaks configured to jointly define a single joint transmission peak within the selected wavelength range that is adjustable by tuning of the dual tunable wavelength selection elements. Tuning of the tunable wavelength selection elements provides for adjustment of the free spectral ranges of the elements, and hence adjustment of the two sets of transmission peaks, to provide for wavelength selection via a vernier effect.